

WHAT IS CLAIMED IS:

1. An apparatus for controlling upshifting and downshifting of a bicycle transmission, wherein the apparatus comprises:

a running condition detecting mechanism that detects a running condition of the bicycle;

a threshold value setting mechanism that sets at least one of an upshift threshold value and a downshift threshold value for the running condition; and

a control mechanism that provides a signal that commands at least one of an upshift and a downshift when the running condition is beyond the corresponding one of the upshift threshold value and the downshift threshold value for a first predetermined time interval.

2. The apparatus according to claim 1 wherein the running condition detecting mechanism comprises a wheel speed detector.

3. The apparatus according to claim 2 wherein the wheel speed detector comprises an alternating current generator that rotates with a wheel of the bicycle.

4. The apparatus according to claim 1 wherein the running condition detecting mechanism comprises a crank revolution detector.

5. The apparatus according to claim 1 further comprising an electromotive device adapted to be coupled to the bicycle transmission for operating the bicycle transmission, wherein the electromotive device is operated by the signal from the control mechanism.

6. The apparatus according to claim 1 wherein the threshold value setting mechanism sets an upshift threshold value, and wherein the control mechanism provides a signal that commands an upshift when the running condition is above the upshift threshold value for the first predetermined time interval.

7. The apparatus according to claim 6 wherein the threshold value setting mechanism sets a downshift threshold value, and wherein the control mechanism provides a signal that commands a downshift when the running condition is below the downshift threshold value.

8. The apparatus according to claim 7 wherein the control mechanism immediately provides a signal that commands a downshift when the running condition is below the downshift threshold value.

9. The apparatus according to claim 8 wherein the running condition detecting mechanism comprises a wheel speed detector.

10. The apparatus according to claim 9 wherein the wheel speed detector comprises an alternating current generator that rotates with a wheel of the bicycle.

11. The apparatus according to claim 8 wherein the running condition detecting mechanism comprises a crank revolution detector.

12. The apparatus according to claim 8 further comprising an electromotive device adapted to be coupled to the bicycle transmission for operating the bicycle transmission, wherein the electromotive device is operated by the signal from the control mechanism.

13. An apparatus for controlling upshifting and downshifting of a bicycle transmission, wherein the apparatus comprises:

- a running condition detecting mechanism that detects a running condition of the bicycle;

- a threshold value setting mechanism that sets at least one of an upshift threshold value and a downshift threshold value for the running condition;

- a control mechanism that provides a signal that commands at least one of an upshift and a downshift when the running condition is beyond the corresponding one of the upshift threshold value and the downshift threshold value at both a first detection and a second detection, wherein the second detection occurs after the first detection; and

- wherein the control mechanism provides the signal after the second detection and not in a time interval between the first detection and the second detection.

14. The apparatus according to claim 13 wherein the second detection occurs a predetermined time interval after the first detection.

15. The apparatus according to claim 13 wherein the signal is provided a predetermined time interval after the second detection.

16. The apparatus according to claim 13 wherein the signal is provided a first predetermined time interval after the second detection, and wherein the second detection occurs a second predetermined time interval after the first detection.

17. The apparatus according to claim 16 wherein the second predetermined time interval is less than the first predetermined time interval.

18. The apparatus according to claim 13 wherein the running condition detecting mechanism comprises a wheel speed detector.

19. The apparatus according to claim 18 wherein the wheel speed detector comprises an alternating current generator that rotates with a wheel of the bicycle.

20. The apparatus according to claim 13 wherein the running condition detecting mechanism comprises a crank revolution detector.

21. The apparatus according to claim 13 further comprising an electromotive device adapted to be coupled to the bicycle transmission for operating the bicycle transmission, wherein the electromotive device is operated by the signal from the control mechanism.

22. The apparatus according to claim 13 wherein the threshold value setting mechanism sets an upshift threshold value, and wherein the control mechanism provides a signal that commands an upshift when the running condition is above the upshift threshold value at the second detection.

23. The apparatus according to claim 22 wherein the threshold value setting mechanism sets a downshift threshold value, and wherein the control mechanism provides a signal that commands a downshift when the running condition is below the downshift threshold value at the second detection.

24. The apparatus according to claim 23 wherein the control mechanism immediately provides a signal that commands a downshift when the running condition is below the downshift threshold value at the second detection.

25. The apparatus according to claim 24 wherein the second detection occurs a predetermined time interval after the first detection.

26. The apparatus according to claim 24 wherein the signal is provided a predetermined time interval after the second detection.

27. The apparatus according to claim 24 wherein the signal is provided a first predetermined time interval after the second detection, and wherein the second detection occurs a second predetermined time interval after the first detection.

28. The apparatus according to claim 27 wherein the second predetermined time interval is less than the first predetermined time interval.

29. The apparatus according to claim 24 wherein the running condition detecting mechanism comprises a wheel speed detector.

30. The apparatus according to claim 29 wherein the wheel speed detector comprises an alternating current generator that rotates with a wheel of the bicycle.

31. The apparatus according to claim 24 wherein the running condition detecting mechanism comprises a crank revolution detector.

32. The apparatus according to claim 24 further comprising an electromotive device adapted to be coupled to the bicycle transmission for operating the bicycle transmission, wherein the electromotive device is operated by the signal from the control mechanism.